

AD-A152 206

EXPLORATORY MAGNETIC SURVEY OF MURRELL'S INLET SOUTH
CAROLINA AND PORTION. (U) GULF SOUTH RESEARCH INST
BATON ROUGE LA A R SALTUS APR 78 DACW54-77-C-0039

1/1

UNCLASSIFIED

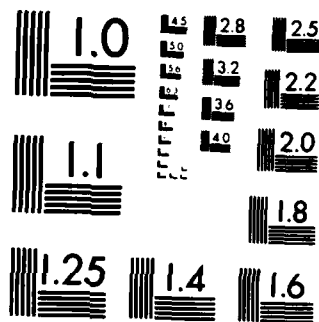
F/G 8/10

NL

END

FORMED

DATE



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

①
EPD

April 1978

AD-A152 206

Final Report
Contract No. DACW 54-77-C-0039

**EXPLORATORY MAGNETIC SURVEY OF MURRELL'S INLET,
SOUTH CAROLINA, AND PORTIONS OF THE MAIN CREEK
INNER CHANNEL**

Prepared for:

U.S. Army Engineer District,
Wilmington
Wilmington, North Carolina

Prepared by:

Gulf South Research Institute
8000 GSRI Avenue
Baton Rouge, Louisiana 70808

DTIC FILE COPY

DTIC
ELECTE
APR 04 1985
S E D

85 08 15 082

This document has been approved
for release and sale in
unlimited quantities.

ERRATA SHEET

Page 4 - quote should read:

The primary finding of the literature search was that Murrell's Inlet did not play a major role in the settlement and development of the area. It was not near enough to any major plantations to serve as a shipping port nor was it as convenient as Georgetown was as a port for inland plantations. It also suffered from the same problem that affects it today -- shifting sands which can drastically change the Inlet's depth and cause the mouth to migrate from year to year. Since Murrell's Inlet village and nearby plantations are less than five miles from the Waccamaw River with its sheltered route to Georgetown, there was really no reason for the Inlet to develop.

Page 5 - Recommendations, 11th line--change special to spatial.

gsri/ GULF SOUTH RESEARCH INSTITUTE
7700 GSRI Avenue Telephone Area Code 504 766 3300 Baton Rouge, Louisiana 70808

April 21, 1978

Final Report
GSRI Project No. 215-879-1-1


Contract No. DACW 54-77-C-0039

EXPLORATORY MAGNETIC SURVEY OF MURRELL'S INLET, SOUTH CAROLINA,
AND PORTIONS OF THE MAIN CREEK INNER CHANNEL

Prepared for:

U.S. Army Engineer District,
Wilmington
P. O. Box 1890
Wilmington, North Carolina 28401

Submitted by:


Allen R. Saltus, Jr.
Senior Archeologist

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution /	
Agency Use Codes	
_____ / or	
Dist _____	
A-1	



CONTENTS

	<u>Page</u>
LIST OF ILLUSTRATIONS.	iii
FINAL REPORT	1
Introduction.	1
Study Objective	2
Area of Study	2
Survey Equipment and Implementation	2
Survey Personnel.	4
Weather and Sea State	4
Survey Implementation	4
Recommendation.	5

LIST OF ILLUSTRATIONS

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Total Study Area of Murrell's Inlet, South Carolina, and Portions of the Auxiliary Channel and Main Creek Inner Channel.	6
2	Southern Portion of Work Area, Auxiliary Channel, Entrance Channel, and Main Creek Inner Channel.	7
3	Northern Portion of Study Area, Main Creek Inner Channel, With Area of Magnetic Anomalies.	8

Final Report

EXPLORATORY MAGNETIC SURVEY OF MURRELL'S INLET, SOUTH CAROLINA, AND PORTIONS OF THE MAIN CREEK INNER CHANNEL

Introduction

As part of the Murrell's Inlet Navigation Project, the following construction is proposed:

1. A jetty on the north side of the inlet, approximately 3,455 feet long, extending from the shoreward end of an existing dune line at elevation 9.0 feet mean low water (mlw) datum to the -10.0 foot mlw datum ocean contour.
2. A jetty on the south side of the inlet, approximately 3,330 feet long, extending from a new sand dike (terminating at the -2 foot contour) to the -10 foot ocean contour.
3. Two sand dikes extending from the existing dune line at +10 feet elevation to the shoreward ends of the stone jetties. The south dike would extend from an existing dune line to -2 foot ocean contour, a length of about 2,850 feet. The north dike would consist of strengthening (by widening) an existing sand dune for a distance of about 500 feet.
4. An entrance channel extending from the -10 foot ocean contour to a point within the jetties, a length of 3,000 feet. The entrance channel would be 300 feet wide and 10 feet deep.
5. A deposition basin between the north jetty and northern limit of the entrance channel to contain littoral material moving southward over the weir section. The side of the basin adjacent to the weir would be 1,300 feet long.
6. Maintenance of an inner channel (consisting of Inner Channel A and Inner Channel B) would extend from the entrance channel through Main Creek to the old Army crash boat dock, a length of 15,440 feet, where it would terminate with a turning basin 300 feet long and 150 feet wide. Since most of the inner channel already exceeds project depth, dredging would be required only in approximately 2.5 miles of shoaled area.
7. An auxiliary channel would extend from the entrance channel to the -10 foot contour at the mouth of Oaks Creek, a length of about 670 feet. The auxiliary channel would be 200 feet wide and 10 feet deep.

Study Objective

The objective of the study was to perform an exploratory magnetometer survey of the underwater areas of Murrell's Inlet, South Carolina, portions of the Main Creek Inner Channel, and auxiliary channels (Maps 1, 2, and 3). The survey was designed to locate historically significant shipwreck materials located beneath the project areas. A proton precession magnetometer was used to gather data on submerged artifacts. Two historically documented vessels were reported lost at or in the inlet, but their exact locations could not be determined for historical documentation. These two vessels are the *Golden Liner Rover* and an unidentified blockade runner (Wright and Albright, 1977).¹

Area of Study

The extent of the survey included, as a minimum, the following areas:

1. The entire area between and under the proposed north and south jetties
2. The seaward extension of the area described in item 1 (above), for at least 500 feet seaward of the ocean bar
3. The shoaled portions of the Inner Channel indicated on the detailed project map (approximately 2.5 linear miles)
4. The Auxiliary Channel

Survey Equipment and Implementation

The survey party proceeded to the site in the Corps of Engineers 20-foot Simmons, after mobilizing a G-806 Geometrics magnetometer aboard the survey craft. The magnetometer sensor head was placed on an aluminum pole which was lashed to the bow of the survey vessel, thus extending the head some eight feet forward of the bow. This

¹Newell O. Wright, Jr., and Alan B. Albright, "Literature Search for the Corps of Engineers' Murrells' Inlet Navigation Project," Research Manuscript Series No. 112, Division of Advanced Studies and Research, Institute of Archeology and Anthropology, University of South Carolina, Columbia, South Carolina.

was done to place the sensor head well out of the range of magnetic interference from such things as the survey vessel, gas tanks, and other ferrous materials such as anchors and boat hooks, which were placed in the stern of the vessel. Control for this survey was provided by Corps of Engineers construction charts and by numbered channel marker buoys.

The magnetometer is a precise electronic instrument that measures the earth's magnetic intensity. In a mobile survey, this magnetic field varies slightly. When ferrous masses are encountered, the variation is accentuated to a point that it becomes abnormal, or anomalous. The magnetic intensity is measured in gammas, which are displayed in a five-whole-digit readout and recorded on a two-digit (0-99 or 100-997) stripchart. At 90 feet either side of the sensor, the earth's field will be accentuated by three gammas, which will be visible on the stripchart recorder.

Since the channel width of the Murrell's Inlet project is 300 feet and the channel itself is well-marked, it was necessary to make only two passes to record any shipwrecks with more than one ton of ferrous mass. (One ton of metal produces a three-gamma inflection at 90 feet; a 10-gamma inflection at 60 feet; and a 90-gamma inflection at 30 feet.) Sailing craft, such as the *Golden Liner Rover* and the unidentified blockade runner, usually contain several tons of ferrous nails and fastenings.

Because of time constraints of this project and the availability of adequate survey control, the research staff decided not to spend three or four days locating and setting up the ground control for the electronic positioning gear. It was decided, instead, to make two passes down the channel of Main Creek, the main channel of Murrell's Inlet, and the auxiliary channel. This procedure would permit detection of any blockade runner or similar vessels, as well as most riverine or coastal craft containing any significant mass of ferrous metal.

Survey Personnel

The exploratory magnetometer survey was conducted on November 8, 1977, by A.R. Saltus, underwater archeologist, GSRI, who operated the magnetometer; and M. Corkran, archeologist, Wilmington District, Corps of Engineers, who operated the survey vessel.

Weather and Sea State

The weather was clear on the date of the survey, and the sea was calm.

Survey Implementation

The inner channel and auxiliary channel were surveyed, as well as both sides of the main channel of Murrell's Inlet. It was not possible to survey the construction areas of the proposed north and south jetties because of extremely shallow shoal waters which prohibited access. On the Piedmont aerial survey photographs taken on March 15, 1975 (identification numbers 2-26 through 2-31), an apparent channel is located just south of the southern end of Garden City Beach (northern portion of the inlet). During the survey of this area, however, the channel was completely shoaled over.

According to the manuscript by Wright and Albright,²

The primary finding of the literature search was that Murrell's Inlet did not play a major role in the settlement and development of the area. It was not near enough to any major plantations to serve as shipping port, nor was it convenient as Georgetown was a port for inland plantations. It also suffered from the same problem that effects (sic) it today; i.e., shifting sands which can drastically change the inlet's depth and cause the mouth to migrate from year to year. Since Murrell's Inlet Village and nearby plantations are less than five miles from Walkama River with its sheltered route to Georgetown, there was really no reason for the inlet to develop.

Results of the Survey

The magnetic exploratory survey of the study areas delineated on the attached maps revealed three major areas of magnetic disturbance. Two of these areas are associated with buoys and are thought to

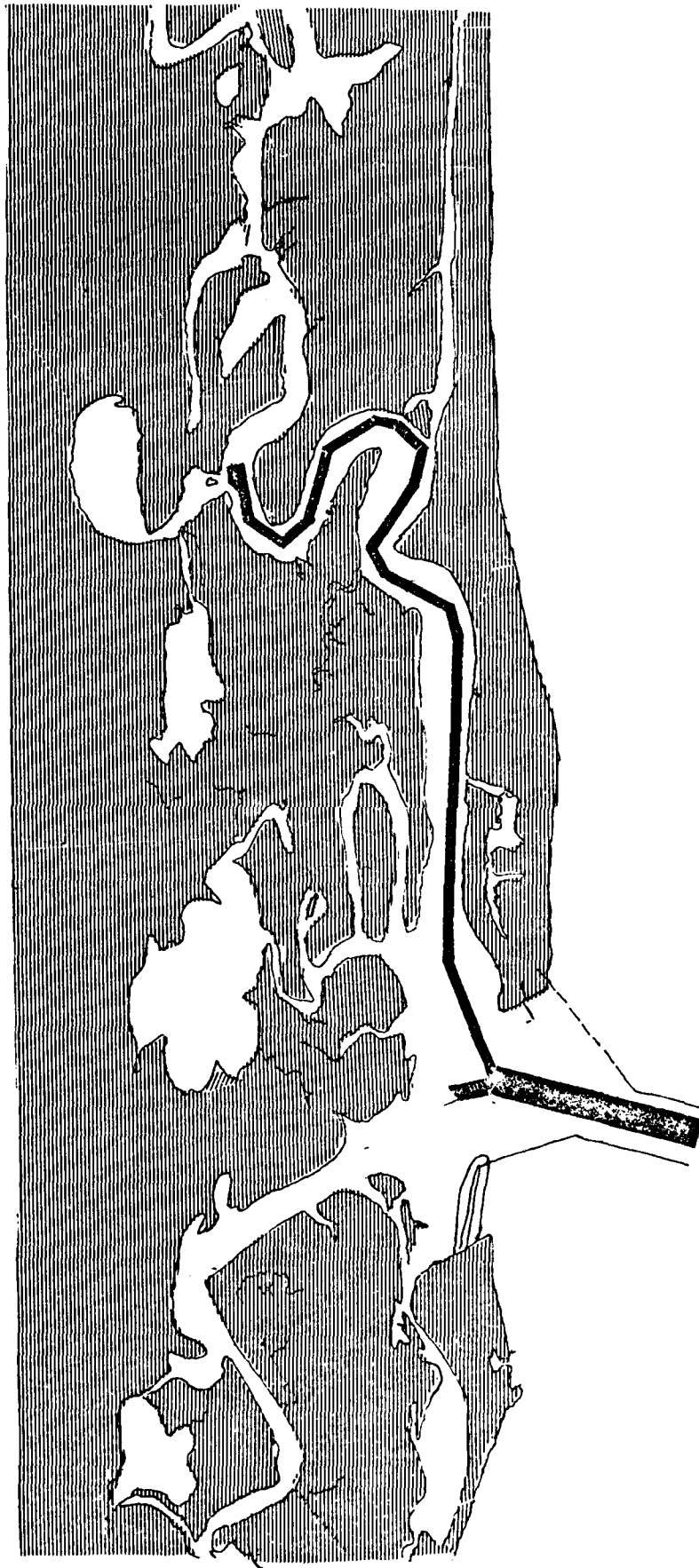
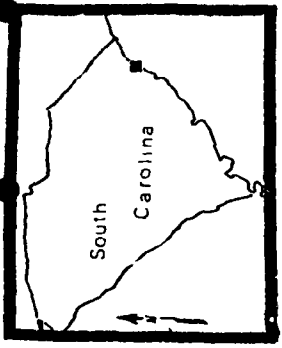
²Ibid.

be caused by the anchoring systems for the buoys. These two anomalous areas are located outside the proposed construction areas. The third anomalous area is associated with the peninsular feature of the channel. It consists of several anomalies covering a fairly large area. One of the anomalies registered several hundred gammas (see map figure). These anomalies could possibly reflect a submerged cultural resource, such as a shipwreck. At this time, however, the significance of the resource and the precise delineation of the site cannot be determined.

Recommendation

Only one magnetic site was located within Murrell's Inlet and the adjacent construction areas during the GSRI exploratory survey. It is recommended that construction be moved 50 feet farther northward and seaward in this portion of the channel to avoid the possible cultural resource. If this is not possible, then a portion of the site may be affected by construction activities. If construction proceeds as planned, the site should be evaluated and delineated prior to the time work activities begin. The investigation should include an in-site magnetic survey designed to delineate the site more precisely. A diver inspection should also be included in order to document and assess any special, historic, or temporal attributes of the site, and to determine whether the site is of National Registry significance.

With regard to the in-site magnetic survey, it is suggested before funds are expended for this purpose, that an underwater archeologist (such as R. Wilbanks or A. Albright of the Institute of Anthropology and Archeology, South Carolina) ground-truth the site to determine whether the anomalous area could be caused by modern cultural materials. Although the magnetic site appears to be of a shipwreck nature, with multiple magnetic components, it is possible that the anomaly is of modern origin. The inlet is quite some distance from shore, but it is possible that it may not always have been at this location (R. Wilbanks, personal communication). The ground-truth investigation, which could be completed within two days, would establish conclusively whether the site is of modern or historic origin.



0 800 ft.

Figure 1. TOTAL STUDY AREA OF MURRELL'S INLET, SOUTH CAROLINA, AND PORTIONS OF THE AUXILIARY CHANNEL AND MAIN CREEK INNER CHANNEL

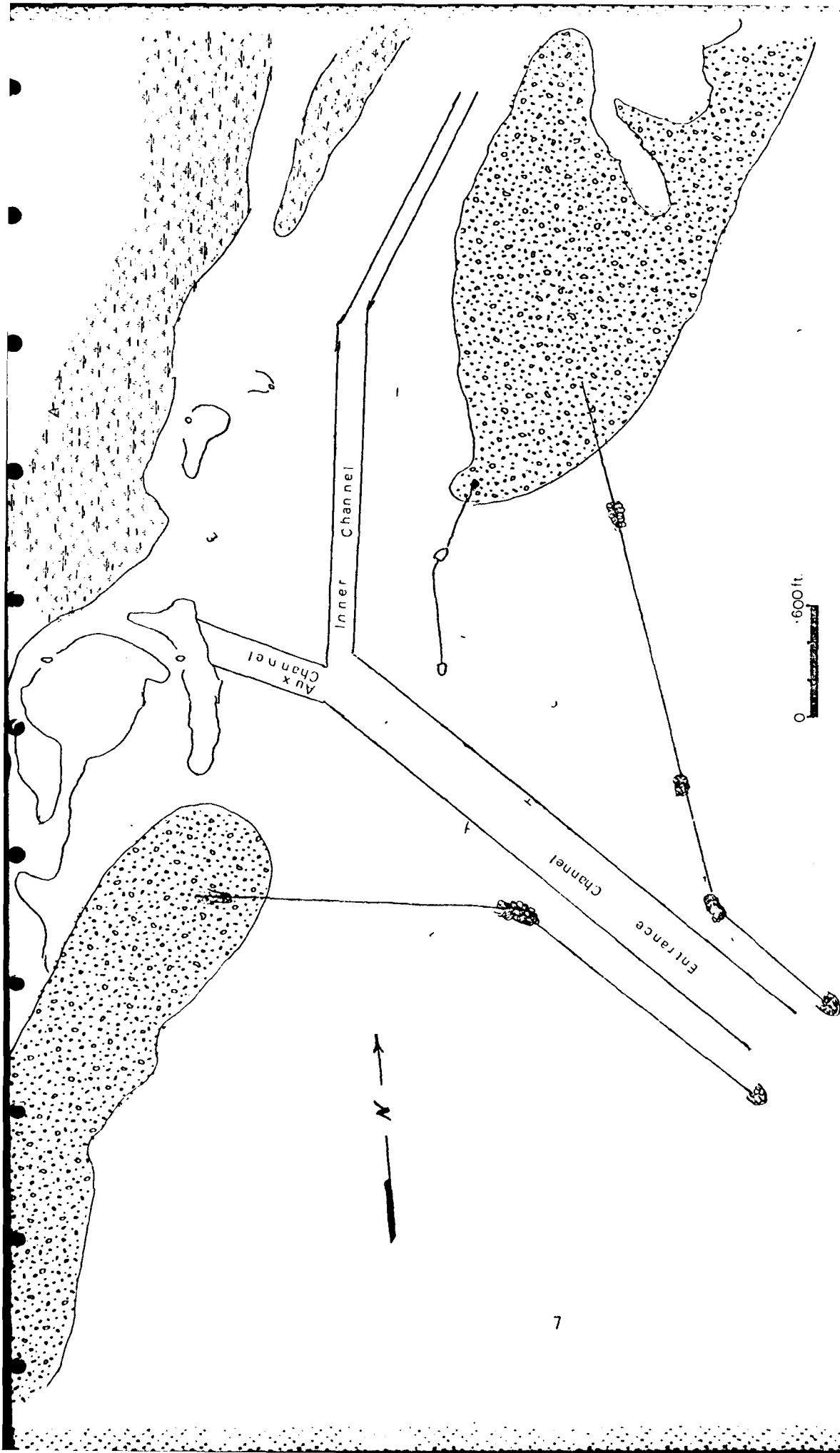


Figure 2. SOUTHERN PORTION OF WORK AREA, AUXILIARY CHANNEL, ENTRANCE CHANNEL, AND MAIN CREEK INNER CHANNEL

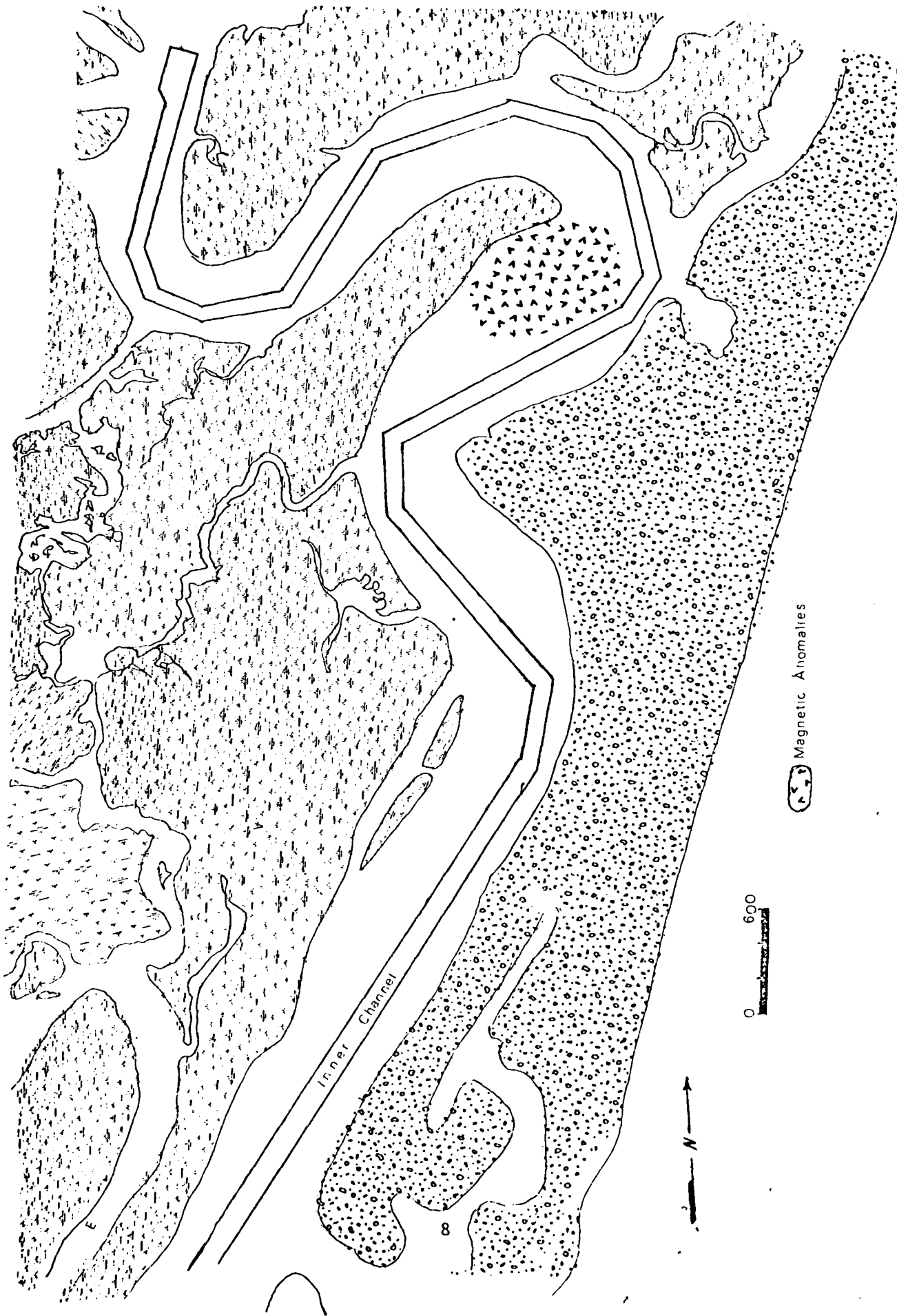


Figure 3. NORTHERN PORTION OF STUDY AREA, MAIN CREEK
INNER CHANNEL, WITH AREA OF MAGNETIC ANOMALIES

END

FILMED

5-85

DTIC

